SUMMARY TRANSLATION OF "RADIO" NO. 01 [JANUARY] FOR 1990

[Rough, summary translations of selected articles, mostly on amateur radio subjects, from **RADIO**, a monthly magazine published jointly by the Ministry of Communication of the USSR and the military-training organization DOSAAF.]

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[Square brackets set off material added by the translator **and not appearing in the original** -- such as a comment, reference, or equivalent expression in another language.]

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Outer front cover, pp 1, 9:

Shown on the cover is a 1990 satellite -- a satellite in the navigational Doppler series with the "Tsidada" ["Cicada"] system. When launched, radioamateur repeaters RS-12 and RS-13, installed on board, will begin to operate.

In their construction and basic data, the RS-12 and RS-13 are "brothers" of the RS-10 and RS-11 that have been in space several years. Their BRTKs [bortovyye radiotekhnicheskiye kompleksy, on-board radioequipment systems, literally on-board radiotechnical complexes][1] are slightly modernized and for this reason are called BRTK - 10 M. They were made by the Volunteer Construction Bureau Attached to the Museum of the History of Cosmonautics Named After K. E. Tsiolkovskiy [obshchestvennoye KB pri Muzeye istorii kosmonavtiki imeni K. E. Tsiolkovskogo], under the direction of A. P. Popkov [sic - Papkov believed correct spelling][2].

Plans are to place the satellite in a circular orbit of approximately 1000 km above the Earth, with an inclination angle of 83° and a rotation period of 105 minutes. The maximum output power of its repeaters will be about 8 watts. The repeaters are designed for operation on several bands, offset [? - sdvinuty] with respect to [those used by] RS-10 and RS-11. The repeater will permit simultaneous operation in Modes A (from Earth on 144 MHz, to Earth on 28 MHz), K (21 and 28 MHz), T (21 and 144 MHz), KA (from Earth on 21 and 144 MHz, to Earth on 28 MHz), and KT (from Earth on 21 MHz, to Earth on 29 and 144 MHz).

In these same modes, it will be possible to receive beacon signals and conduct QSOs with on-board robots.

pp 2 - 4, 34 - 36: "PERSPECTIVES FOR DEVELOPING CONSUMER RADIO EQUIPMENT," by Igor' Georgiyevich Glebov, First Deputy Chief, Main Administration for Scientic-Technical Development, Ministry of Communication of the USSR.

[Description, supplemented by tables and illustrations, of "BREA" -- bytovaya radioelektronnaya apparatura -- consumer radioelectronic equipment during the XII (1986 - 1990), XIII (1991 - 1995), and XIV (1996 - 2000) five-year plans.]

... Increasing the types and quanitites of BREA will of course take time, whereas products are needed today. So a decision has been taken to import large shipments of kinoscopes [picture tubes] and associated goods. Manufacturing is to be broadened using facilities converted from the defense industry.

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[1]For details on RS-10/RS-11 and on the original "BRTKs," see RADIO #05/1987, outer front cover and p 12 (summary translation, pp 1 - 2); Sovetskiy Patriot of 1 July 1987, p 4 (summary translation #06/1989, pp a - d; RADIO #10/1987, pp 4 - 8 (summary translation, pp 3 - 16).

[2]For details concerning Aleksandr Pavlovich Papkov, UA3XBU, see RADIO #10/1987, p 4 (summary translation, p 4).

... Converted facilities [from the defense industry] will be used to manufacture both existing and new products, the latter including portable individual radiostations[3] and radioreceiving devices (accessories) for direct reception of television via repeaters in geostationary satellites, radiotelephones, and so on.

Since the demand for BREA will exist for an indefinite time, very significant capital investment is justified. [A year-by-year description of new and improved products to be manufactured during the XIII five-year plan (1991 through 1995) follows.]

... Industrial introduction of HDTV [televideniye vysokoy chetkosti - TVCh] will begin in the period 1995 - 1997. It's already evident that by 2000 two television systems will exist: HDTV and regular television. Alongside regular television sets, wide-screen ones will appear for receiving HDTV (format 9 x 16, compared to today's 3 x 4 format).

... High-quality over-the-air radio broadcasting in digital form via repeaters in geostationary satellites will be realized in the XIII five-year plan.

pp 8 - 9: "THERE ARE NO DIFFICULT THINGS FOR THOSE WHO TAKE AN INTEREST." [RADIO Senior Editor Ye[lena Vsevolodovna] Turubara interviews Nikolay Ivanovich Lutsenko, President of the new Soviet television company "Nika TV."] [At the end of the interview, Lutsenko explains the company name: Nika TV stands for Nezavisimyy informatsionnyy kanal televideniya -- Independent Information Television Channel; also Nika is the goddess of victory.]

pp 10 - 12: "AT THE 'FOX-HUNTING' COMPETITIONS IN THE K(OREAN) P(EOPLE'S) D(EMOCRATIC) R(EPUBLIC), AND AFTER THEM," by A[natoliy Vladimirovich] Gorokhovskiy [Editor-in-Chief, RADIO magazine]. [Datelined Pyongyang - Moscow.]

We flew to Pyongyang to participate in the traditional "For Friendship and Brotherhood" ["Za druzhbu i bratstvo"] competitions. For a variety of reasons, only sportsmen from the USSR and Czechoslovakia came to the competitions, assuring each team, including the KPDR team, first, second, or third prize.

The Soviet team contained very strong sportsmen, though the most eminent "foxhunters" were at exactly the same time in Czechoslovakia, where the preparatory competitions for the 1990 World Championship were taking place. But our "Korean" team had hopes of winning the very highest prizes. Even though the Korean sportsmen had become our main competitors in recent years, still the Soviet masters [of sport] had the transferable cups, the previous set of which is kept permanently (since 1988) at the Central Radio Club of the USSR Named After E. T. Krenkel'.

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[3]Presumably CB-type transceivers. See announcement of Soviet CB-type service at 27 MHz, in RADIO #11/1989, p 6.

The Soviet mixed team consisted of: Men: Sergey Gureyev, Robertas Dapkus, Margus Meytus, and Rostislav Shpargalo. Women: Lyudmila Prilutskaya, Tat'yana Platon (Kaplina), Aleksandra Rodionova, and Oksana Shutkovskaya. Youth: Andryus Blazhis, Egidiyus Buchas, Aleksey Golovin, and Sergey Shepelev.

I'll point out straight away that our hopes were't realized. In almost all categories, the Korean sportsmen pulled ahead [? - vyrvalis' vpered].

The first day, in the 3.5 MHz competitions, the Korean sportsmen led among the men, women, and youth, and took the first three individual places among the men and youths; only L[yudmila] Prilutskaya succeeded in taking third place among the women.

A day later, 144-MHz competitions were held. This time, the Soviet men's team managed to earn "gold," but the KPDR team lagged by only 12 points.

Tanya Platon earned a silver medal; no other individual on the Soviet team earned silver, not to mention gold. The Korean women took first and second individual prizes, and the Korean youth took all three places.

On the last day, the sportsmen threw grenades. And while the Soviet team retains its traditional lead in small-caliber shooting, it remains just as traditionally behind in grenade throwing.

What's the reason for our unsatisfactory performance?

The Koreans were in far better physical shape. They are professionals; sport is their main occupation. They train hard every day according to a prescribed program. Multiply this by their hardworking nature. They'd be up training at 5:30 or 6:00 a.m. while participants from other countries were still aleep.

It's becoming harder and harder to compete with Korean (and incidentally with Chinese) sportsmen in "foxhunting" since it has become a professional matter for them. The Koreans are way ahead of us on depth, with several fully-qualified teams.

Other problems include a lack of attractive uniforms, insufficient qualified trainers, and an absence of clear rules for selecting participants.

"Foxhunting" has many problems requiring resolution if we are not to yield our [leading] positions at international meetings.

pp 13 - 15: "THE EARTH IN A SENSE COMES TO LIFE ...," by B[oris Grigor'yevich] Stepanov, UW3AX [Deputy Editor-in-Chief, RADIO, and editor of the "NLD" ("na lyubitel'skikh diapazonakh" - "On the Amateur Bands") columnn in the newspaper "Sovetskiy patriot"].

[from introduction by UW3AX]

Very little written material is left from the months spent getting Soviet cosmonauts on the amateur airwaves. The editors of "Radio" were busy with the first Soviet-Finnish expedition to Malyy Vysotskiy island -- and by the way with their basic job of preparing regular issues of the magazine. We should not remain silent about the work of Sergey Samburov, an employee of the NPO [nauchno-proizvodstennoye ob"yedineniye - scientific-production association] "Energiya," who was once a shortwave radio amateur and operated at a collective station in Kaluga. The success of "Operation U-MIR" is due in large measure to his enthusiasm and to the lumps he developed forcing amateur communication on board the "Mir" complex. There's something symbolic in the fact that one more step (even a very small one) in the history of amateur radio and space was made by the great-grandson of K. E. Tsiolkovkiy -- Sergey Samburov. What did things look like aboard the "Mir" complex? A meeting is described with Pilot-Cosmonaut of the USSR Musa [Khiramanovich] Manarov, U2MIR, who shares his impressions of almost a month and a half of operation from space on the amateur airwaves.

[from "Q's and A's"]

Q: Let's go back to early last year, when the crew of the orbiting complex "Mir' received a letter from "Radio" magazine suggesting going on the air...

A: Let's go back several months earlier. Before the flight, representatives of the psychological support group wanted to know which periodicals I would like to receive in space. "Radio" was the only magazine I mentioned. But there was no "Radio" in the first batch of mail delivered. I made a fuss and it turned out they had forgotten my request. So with the next delivery we received several issues of "Radio." Up to then the editors of "Radio" had been an abstraction, but at that point they became a living collective. Not just magazines, but a letter came with kind words for our crew!

Q: And the suggestion to operate on the amateur airwaves?

A: Yes. At first we were somewhat skeptical, having in mind the complicated professional communication systems, whereas what was being discussed here was something small, simple, amateur. In general, we wanted to try, but were also skeptical. The experience with the "Okean" ["Ocean"] broadcasting receiver also helped put us in the mood. It had been sent at our request, but nothing was audible except whistles and crackling sounds! We decided to try a homemade external antenna (before the ultrashortwave antenna was sent), which we soldered together out of several pieces of wire to be installed during our excursion in open space. But during the first excursion there wasn't enough time, and later your antenna arrived.

Q: I know you had to work on it some -- we didn't take everything into account [working on it] on Earth.
A: We added a loop [petlya] with which to secure it to the helyard [rope? tackle?] [k falu]. Otherwise we might be chasing it all over the universe! On the end of the antenna we fastened a flag of the USSR, removed [by cutting the stitches] from one of the suits and signed, on the back, "U1MIR, "U2MIR," and "U3MIR." I must say Mission Control didn't want to include installation of the antenna in the program for the regularly-scheduled excursion in open space. But we kept asking Mission Control and got our way: If time remained it would be OK. We were lucky. We were able to accomplish not ony the basic program but also all supplementary programs, including installation of this antenna.

Q: Was it hard to install?
A: No. It fit easily into the socket [raz"yem] on the body of the spacecraft. So from the technical point of view, we were ready to operate by the end of October [1988], but didn't have any operating experience. True, we had studied the "Shortwaver's Guide" ["Spravochnik korotkovolnovika"] and had learned a lot from the lessons you gave us on the service channels. But still the skeptical attitude didn't leave us. Nor was it alleviated by the first contact with Atlanta (W4BIW). We heard poorly, and thought it would always be like this. But very soon we had normal contacts, including some [with stations] with deafening loudness.

Q: And so you plunged into the amateur airwaves. What was the reaction of the first stations you worked?
A: I must say information on our operation was passed poorly. At first we weren't convinced anyone could hear us. I tried several times (maybe not too delicately) to enter into contact with stations working each other, but wasn't successful. Finally, we "broke" a communication between two American shortwavers. They copied my callsign and exchanged remarks along the lines "Do you understand anything?" "No!" "Me either. It's probably someone playing a trick on us..." But Indian shortwaver VU2LK said straight out during our first contact that he didn't believe we were operating from a spacecraft. All I could say was "But it's the truth!" Well, the information finally got around the world, and then the problem was the number of stations calling us. This was especially so when we were within line-of-sight distance of the European continent and southeast Asia, where on account of the number of stations the received signal resembled white noise. Contacts with Japan, by the way, were few, as most operators were busy with their own conversations. Only a few stations called me; some had especially learned how to call in Russian.

Q: By the way, what about the language barrier?
A: There were difficulties with stations in South and Central America, where many radio amateurs don't speak English. Strange things happened. I got into contact with a YL -- LU1YK. When she finally realized she was working an orbiting space station, she literally cried out "Wait for me a minute!" -- even though our spacecraft was racing above her country at a space rate of speed. But everything turned out well: Before the spacecraft left communication range, she had time to get LU6YH on frequency, and he spoke good English. We met foreign shortwavers who spoke not bad Russian, and many of those who didn't speak Russian tried to say at least a few words -- "Zdravstvuyte" ["hello"] and so on.

Q: Musa, surely there were no problems with our own amateurs?
A: There was a "language" problem in receiving callsigns. Sometimes it was rather difficult after an avalanche [posle vala] of callsigns which you received in English spelled out in the English phonetic alphabet, to write them down in Russian phonetics. As a rule, our stations had low signal levels and their signals were more muted [? - i sam signal byl boleye "glukhim"].

Q: What can I say, Musa, homemade is homemade!
A: I understand. But in general our stations were very few in number. In all fairness [though] I must say that our possibilities for working Soviet shortwavers were limited. We were basically over the territory of the USSR during "night" orbits, when the crew was asleep. And if you stayed awake you got involved [? - zadeystvovan] with communications with the Flight Control Center.[4] My attempts to operate the amateur station under these conditions turned out badly. First, it was necesary to keep an ear out the whole time for calls from the Flight Control Center -- questions might arise that I had to answer. Second, two microphones were constantly being confused: The amateur station microphone and the radiomicrophone for communicating with the Flight Control Center.

Q: Radiomicrophone? Did official communications between the orbiting complex and Mission Control go via a repeater as it were?
A: To some degree. On receive, loudspeaker communication is used; on transmit a radiomicrophone may be used also. I must say that before us, it practically wasn't used [at all]. But I like such gadgets. We quietly mastered the radiomicrophone and then the visiting crews began to use it, as did the crew that replaced us. Of course, several complications arose when using the radiomicrophone (each crew member has one, but there's [only] one channel). When we talk, we look at one another to see who wishes to speak and should be "given" the microphone.

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[4]Manarov's comment may mean that if Mission Control heard him operating on the amateur bands it would feel free to engage him in official communication, whereas if Mission Control heard nothing it would assume the crew was sleeping and would remain silent.

Q: And what about mutual interference between amateur and professional communication systems on board the complex?
A: There was full electromagnetic compatibility. But, in fact, as I said, it's difficult to operate simultaneously and we had to divide up the time. Outside communications range of the USSR, there was much more free time.

Q: Musa, how about a few words now about your impressions of amateur communication? What did it do for you on board?
A: During the whole flight, we looked at Earth through an illuminator [illyuminator]. The pictures were so beautiful they took our breath away, even though we are people who have learned to control our emotions. But the planet was perceived to some degree as not being alive. Of course the traces of man's activities (both good and bad) were visible from up there, but people weren't visible or audible. And the perception of Earth changed very sharply when an amateur radio station appeared on board. It's an indescribable sensation to be flying in space over some country and have a friendly conversation with one of its citizens. The Earth, which we longed for a good deal, somehow came alive and got closer.

Q: Did you use a computer in amateur communication?
A: Yes, we did. Especially for determining direct, line-of-sight areas: For example, physical exercises are scheduled for an hour, with breaks. You're running on the track and you look at the display screen. When a direct line-of-sight area corresponding to a country of interest approaches, you take a break, make several contacts, and resume the exercises. But the way, I revised the program in such a way that not all the [surface of the] Earth was depicted but large squares. This turned out to be very convenient.

Q: That is, you also engaged in programming on board?
A: I wasn't the only one. Valeriy Polyakov, for example, made a program with a musical timer playing several melodies indicating it was time for communication with the Flight Control Center, etc.

Boris, I feel we've already said a lot more than can really fit into a magazine article. I would like to mention one other thing. It seems to me it wouldn't be bad to think of new forms of space/Earth communications (besides the ordinary ones that we've conducted up til now). What I have in mind are competitions [sorevnovaniya] or a contest [konkurs] involving contacts with cosmonauts. I don't have enough experience with amateur communication to make any concrete suggestions. Here shortwavers should have the main say.

p 15: "ULTRASHORTAVE CHAMPIONSHIP OF THE USSR" ["CHEMPIONAT SSSR HA UKV"], by E. Zigel', Senior Judge of the Competitions, Klaipeda, Lithuanian SSR.

The best ultrashortwavers in the country took part in the finals of the XVII Championship of the USSR in the Lithuanian city of Klaipeda.

The Estonian team took first place, followed by the Russian and Ukrainian teams.

Master of Sport of the USSR A. Poshekhonov from Leningrad was first on 430 MHz, Master of Sport of the USSR S. Korobko from the RSFSR was first on 1260 MHz, and Master of Sport of the USSR V. Petrushenko from the Ukraine was first on 5.6 GHz.

T. Khallikivi became Radiocommunication Champion of the USSR. T. Kull' and T. Kasonen received the silver and bronze medals. [These three comprised the winning Estonian team.]

Unfortunately, it must be noted that no team participated from the Lithuanian SSR [where the competitions were held].

pp 16 - 17: "PEOPLE'S DIPLOMACY." [Two letters to the editor concerning contacts between Soviet and foreign amateurs.]

"SUCH A FAR-AWAY, NEAR-BY AMERICA"

from Ye. Kostromin, UA4RZ, President, Zilan DX Club, Kazan'

From 2 through 15 July 1989, a group of radio amateurs from Seattle (USA) were guests of the Zilan DXClub in Kazan'.

In 1985, an initiative group [initsiativnaa gruppa] from the Western Washington DX Club of Seattle, headed by G. Bok [Jack D. Bock], K7ZR, and R[andall W.] Brink, KD7IK, undertook efforts to establish relations with Soviet counterparts.

The WWDXC sent proposals to radio clubs in L'vov, Kazan', Tashkent, and Magadan. Radio amateurs from the first three cities responded. In addition, the ZDXC from L'vov and the Zilan DXC from Kazan' suggested organizing joint expeditions in the USSR and the USA. After several "round tables," it was concluded that the greatest interest was in DXpeditions to Armenia and Wyoming.

Financial problems were handled by the L'vov and Kazan' clubs.

Unfortunately, the earthquake in Armenia [7 December 1988] forced cancellation of the expedition there, and the Council of the Zilan DX Club decided to offer the Americans a visit to the shores of the Volga [River] in 1989.

There were no problems getting licenses issued for operating from USSR territory, thanks to N[ikolay] V[alentinovich] Kazanskiy, UA3AF. For 10 days, UA4/K7ZR, UA4/K7UDG, UA4/K7RA, UA4/KE7V, and UA4/WR7Q were on the air. Special callsign US4P, issued on this occasion, was very popular during the two days of the IARU Championship. In 48 hours, 6000 QSOs were conducted with 150 oblasts of the USSR and 135 countries of the world. Incidently, the Zilan DXC issued a special pennant-QSL for two contacts with USP on different bands or using different modes.

Since this was a "people's diplomacy" event, we decided to plunge our guests head first into our reality [deystvitel'nost']: They lived in apartments of Soviet shortwavers, ate our food, and used public transportation.[5] True, all of this was embellished a bit by the element of festiveness surrounding the participants.

Twice we organized conferences at which questions were asked in both directions. We were interested, for example, in learning about conditions for obtaining permission to go on the air in the USA. We were surprised by the punctuality observed by the Americans[6] when examinations are taken by beginners and by those wishing to increase their category [i.e. those wishing to upgrade].

Everything's precisely regulated and perfected. You need to select one correct answer out of four, to 30 specific questions (seven errors are permitted). You can immediately go for extra class if you have enough knowledge. Only two of our radio amateurs succeeded in passing the examination for an American callsign (UW9AR and UA4RZ) and for extra class. It wouldn't hurt if our services responsible for the development of amateur radio adopted a similar practice.

Our guests visited Moscow, Zagorsk, Kazan', Sviyazhsk, and Ul'yanovsk. Some were able to spend time in Volgograd, Dubno, and Arkhangel'sk. They conducted over a thousand QSOs.

In connection with this, I'd like to discuss one fact: According to a provision in the Instruction on Operating Radio Stations, we're prohibited from allowing others to operate our home radio stations. Perhaps this provision made some sense at one time, but now it only leads to misunderstanding: What's the difference whether we sit side by side at a collective station or at an individual station? And we took the Americans to places foreigners formerly weren't even allowed near. The local authorities were understanding and there were no problems. In general, only thanks to perestroyka has it become possible to organize local radio clubs in the USSR operating on a self-supporting basis. And since this tendency has appeared, it would make sense for the Central Committee of DOSAAF USSR to think about the status of such clubs, since they are of obvious utility, their operation is becoming more lively, and the future, as in other forms of sport, belongs to clubs.

Photo: Kazan' radioamateurs greeting their American colleagues with bread and salt [a traditional Russian greeting].

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[5]A possible reference to the way most foreign visitors to the USSR are insulated from Soviet "reality" by the separate and superior facilities provided by Intourist.

[6]Presumably, the [relative] speed with which licenses are issued.

"ON THE AIR -- DL/UA9X"

from V. Shishelov, UA9XW
delegation leader, Syktyvkar [capital of the Komi ASSR]

In May 1989, a delegation of West German radio amateurs made a visit to the Komi ASSR, organized through the "Sputnik" Bureau of international youth tourism, with participation by the sponsors -- the oblast' committees of the Komsomol [party youth organization] and of DOSAAF of the Komi ASSR, higher educational institutions of the Republic, Friendship Houses, Palaces of Pioneers and Schoolchildren, and the Ukhta Cooperative "Azimut."

The group was basically composed of shortwavers from southern Bavaria. It was headed by Gerhard Scharf, DL8MBU, Chairman of the national radioamateur organization of the FRG (DARC) and Dr. Hans Schwarz, DK5JI, editor of the radioamateur magazine "CQ-DL." The guests acquainted themselves with the lives of the northerners, discussed operating experience, and took part in the international shortwave radiocommunication competitions "Miru-mir."[7] For 10 days, 12 callsigns, UA9X/DL..., sounded out over the air.

And from 6 through 16 August, 12 amateur callsigns from the Komi ASSR -- DL/UA9X... -- sounded out from the FRG.

The West German colleagues received the Soviet radio amateurs very warmly. We visited 10 cities in the FRG, got acquainted with the history of the country and with the everyday life of radioamateur families. The Komi shortwavers' team, operating from collective station DL0MIR, took part in the WAE DX CONTEST.

The Soviet visit caused a great reaction [rezonans], not limited to the radioamateur community. It was very pleasant that the mass media in all the cities devoted a great deal of attention to the visit. The burgomeisters of the cities visited and their assistants found time for personal meetings with the Soviet delegation.

So great was the desire on both sides to get to know one another that the converations ended well past midnight. Not everyone believed what was going on: Some Soviet shortwavers even called our stations, operating from the FRG, "pirates."

The visit would probably not have been possible were it not for DARC's understanding and trust, shown by Karl Diebold, DJ1BM, Alfred Reichel, DF1QM, and Gerhard Scharf, DL8MBU, as well as the German amateurs' desire for the meeting.

As a result of the meeting in the FRG, an agreement was signed on cooperation between our radioamateur organizations.

Our delegation picked up much that was new and interesting from experiencing amateur radio in the FRG and opened the way to an exchange of groups of young radioamateurs as well as to a further strengthening of contacts between our countries.

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[7]"Miru mir" literally means "To the world peace." "Mir," dative "miru," is a masculine noun meaning both "world" and "peace."

p 18: "'RADIOAMATEURS IN SPACE. DON'T DROP OUT OF THE CREATIVE ORBIT.'"

Under this headline, an article on problems of developing independent technical creativity in one of the most promising directions -- the creation of amateur space systems -- appeared in last year's April issue[8]. The article's purpose was to invite everyone -- from the amateur community to the leaders of the DOSAAF USSR Central Committee involved in [??? - kuriryuyshchiye] the field of activity of radioelectronics enthusiasts, to become active in getting out us of the stagnation we find ourselves in.

After many reminders and many months of waiting, we finally received an answer from the Administration of Technical and Military-Application Forms of Sport of the Central Committee of DOSAAF USSR, over the signature of its chief, A. G. Vinnik. However, we are deeply convinced that it [the answer] is nothing other than an attempt to "close the matter" and tone down [zatushevat'] the matters raised by the magazine.

The answer notes that so far there are only two volunteer laboratories [working on amateur satellites], headed by A[eksandr] P[avlovich] Papkov [UA3XBU] and V[ladimir] I. Chepyzhenko [RC2CA], which creates a sort of monopoly situation, but continues that in the event new volunteer laboratories appear, they will be supported. The article, on the other hand, posed the question of increasing the number of people able to design BRTKs and of undertaking active organizational work rather than passively awaiting the appearance of new volunteer laboratories.

The answer dealt with the problem of mass participation by stating that according to the article, 60 to 150 persons had taken part in satellite competitions and comparing this to the 1327 who had [ever] communicated via satellite. This ratio of 7.5% compared favorably to the 5% who participate in ultrashortwave competitions and the 2.7% who participate in shortwave ones. Then the reply, in all seriousness, states "the proportion between the overall number of radio amateurs and the number of satellite radio amateurs in the USA and the USSR is higher in the USSR."[9]

No answer in given in the reply as to whether the volunteer basis will be broadened in the design of satellite systems competitively and whether student collectives and NTTM [nachno-tekhnicheskoye tvorchestvo molodezhi - scientific-technical creativity youth] centers will be involved in this work.

Why are we delaying [??? - Pochemu my "tyanem rezinu"] in joining with amateur radio organizations in the socialist countries to construct a satellite? Why don't we cooperate with AMSAT?

And, finally, the main question: How can we have perestroyka so as not to drop out of the orbit of creativity? This question awaits a concrete answer.

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[8]See RADIO #04/1989, pp 2 - 5 (summary translation pp 1 - 6).

[9]I have no idea what this means!

p 19: "CALENDAR OF RADIOSPORT COMPETITIONS FOR 1990." [Dates and places for RSFSR and USSR competitions.]

pp 19 - 21: "CQ-U."

INFO*INFO*INFO

edited by A[eksandr Ivanovich] Gusev, UA3AVG

ADDRESSES OF QSL-BUREAUS.

Beginning with this issue, the editors will regularly provide addresses of QSL-bureaus, both official and voluntary ones. An attempt will be made to include all QSL-bureaus in an "oblast'" (according to the R-100-O listing).

NOVGORODSKAYA OBLAST' (No. 144, 1T)

173025, g. Novgorod-25, ab. yashch. 47 [P. O. Box 47, 173025 NOVGOROD-25] (services the whole oblast');

174400, g. Borovichi Novgorodskoy obl., ul. Leningradskaya, 66 [66 Leningradskaya St., 174400 BOROVICHI (Novgorodskaya Oblast')] (services the town of Borovichi);

175400, g. Valday, Novgorodskoy obl., ab. yashch. 39 [P. O. Box 9, 175400 VALDAY (Novgorodskaya Oblast')] (services the town of Valday);

175460, pos. Kresttsy Novgorodskoy obl., ul. Lesnaya, 29-a, radioklub [Radio Club, 29-a Lesnaya St., 175460 KRESTTSY SETTLEMENT (Novgorodskaya Oblast')] (services the settlement of Kresttsy);

175200, g. Staraya Russa Novgorodskoy obl., ab. yashch. 1 [P. O. Box 1, 175200 STARAYA RUSSA (Novgorodskaya Oblast')] (services the town of Staraya Russa).

PSKOVSKAYA OBLAST' (No. 149, 1W)

180006, Pskov-6, ul. Shkol'naya 16 [16 Shkol'naya St., 180006 PSKOV-6] (services the whole oblast');

182000, g. Velikiye Luki Pskovskoy obl., ul. R. Lyuksemburg, 12 [12 R. Luxemburg St., 182000 VELIKIYE LUKI (Pskovskaya Oblast')] (services the town of Velikiye Luki and the surrounding rayon).

MURMANSKAYA OBLAST' (No. 143, 1Z)

183792, g. Murmansk, ul. Dzerzhinskogo, 4, OTSh DOSAAF [DOSAAF Combined Technical School, 4 Dzerzhinskiy Street, 193792 MURMANSK] (services the whole oblast');

184200, g. Apatity Murmanskoy obl., ab. yashch. 460 [P. O. Box 460, 184200 APATITY (Murmanskaya Oblast')] (services the towns of Apatity and Kirovsk and the settlement of Polyarnyye Zori);

184284, g. Olenegorsk Murmanskoy obl., ab. yashch. 19, UZ1ZWG [UZ1ZWG, P. O. Box 19, 184284 OLENEGORSK (Murmanskaya Oblast')] (services the town of Olenegorsk).

QSL VIA...

UZ1PWA is the QSL manager for UA1PAU (Cape Sin'kin Nos), UA1PBD (polar station Yushar), RA1QEG/RW1P (polar station Kara), and UB5MAL/UA1O (Novaya Zemlya). QSL cards should be sent to 164744, Amderma Arkhangel'skoy oblasti, ab. yashch. 73, UZ1PWA [UZ1PWA, P. O. Box 73, 164744 AMDERMA (Arkhangel'skaya Oblast')].

For Soviet amateurs, the QSL manager for RZ1OWA is UZ1OWW, whose address is 164500, g. Severodvinsk Arkhangel'skoy oblasti, ab. yashch. 55, gorodskaya stantsiya yunykh tekhnikov, UZ1OWW [UZ1OWW, Station of Young Technicians, P. O. Box 55, 164500 SEVERODVINSK (Arkhangel'skaya Oblast')].

QSL cards for R1ATM and EO1ATN should be sent to UZ1TWW.

QRP NEWS. UV3AES reports that in the year he's been operating with a 700 mW transceiver on 160m he's worked 39 "oblasts" of the USSR and also SP6CZ and OH3SR. The lowest report he's received is 54.

ACHIEVEMENTS ON 160 M.

● Карточки-квитанции за связи со станциями R1ATM и EO1ATN следует направлять оператором UZ1TWW.

ORP-ВЕСТИ

Как сообщает в редакцию UV3AES, он в течение года в диапазоне 160 м работал на трансивере с выходной мощностью около 700 мВт. Ему удалось связаться со станциями из 39 «областей» СССР, а также с SP6CZ и OH3SR. Самая низкая оценка сигнала — 54.

ДОСТИЖЕНИЯ НА ДИАПАЗОНЕ 160 м

Позывной	CFM QSO	WKD QSO
P-150-C		
UT5AB	160	172
RT4UA	157	162
UA4HBW	156	162
UQ2PZ	148	153
RA3DOX	144	153
RT5UY	143	156
UA2FF	140	160
UZ6LWZ	124	157
UW3QR	116	146
UA9MR	109	122
P-100-O		
UW3QR	174	180
RA9JBC	171	172
UA9AQN	168	169
UA6HJF	164	168
UA9APX	164	168
UA3QUQ	161	165
UM8MVM	159	169
UA9AAY	159	163
RA4SBJ	157	157
UA9MR	156	167
* * *		
UQ2GMB	151	153
UZ7MAP	150	150
UM8NZ	149	149
UC2WAZ	148	148
UF6FX	117	128

Сведения для очередной таблицы достижений просим прислать в редакцию до 15 февраля 1990 г.

Раздел ведет
А. ГУСЕВ (UA3AVG)

VHF*UHF*SHF
edited by S. Bubennikov

E_s-PROPAGATION.

...

Very distant contacts deserve special attention. The distance of a "standard" communication caused by reflection from the E_s-layer is usually 1300 to 2000 km. ... Along with single-hop reflection from the E_s-cloud (communication distance up to 2400 km), a dual-hop one can occur (with an intermediate reflection of waves from the Earth). When this happens the distance between stations can reach 2600 to 4000 km. However, the probability that such a long (over 1500 km) E_s-cloud with an MUF of over 144 MHz, or of an overlapping of two ordinary, small clouds on one great-circle arc to some other station is insignificant. Yet such QSOs succeed on 144 MHz from time to time. This year there were more than ever.

Judging by reports, the first time this happed in the last season was 16 June [1989], when UD6DE contacted OH2TU and OH5LK (distance 2700 - 2800 km). In all probability, radiowaves were propagated in the same way between UA4API and LA6VBA (distance about 2500 km). On 17 June, UG6AD worked stations in the FRG, not less than 2700 km away, and UL7BAT had a QSO with RB5EU (2600 km).

The most improbable event occurred 21 July. According to UG6AD's observations, what was doubtless a two-hop propagation mechanism was operating from 1312 to 1523 UT. In that period he made one contact with Sweden, three with the GDR, and ten with Denmark and the northern Laender of the FRG. UD6DE conducted two-hop communications with OK1KT, DL8HCZ, DF8LC, DK1KO, Y21TC, SP1EOI, SP1JOI, DF2LH, DL8LAQ, DG6JF/P, DB1HX, OZ1LO, OZ1EH, Y24LA, DK3UZ, Y22SA, and UQ2GCG. UA6HFY and RA6HLT from Stavropol'skiy Kray contacted SM7DKF. UL7AAX from Shevchenko worked Poland, Czechoslovakia, Austria, the GDR, Finland, Denmark, and the FRG. And the farthest for many U's that day were representatives of the Netherlands; thus, RA6HHT from Stavropol' worked PA3DSS (2700 km). UA4API worked a PA 2800 km away. UG6AD worked PA3DSS (3245 km), the farthest of three PAs he contacted. UL7AAX worked PAs over 3400 km away. UD6DE worked PE3LDX, PA3BXH, PA3FBP, PA3CEE, PE1LAU, and PA3FFX; PE3LDX was 3587 km away, 140 km greater than the all-Union achievement for this form of communication (the European record of 3865 km was set in 1983). And finally, on 22 July UA1ZCG from Zapolyarnyy, Murmanskaya Oblast', worked YU1WP, 2800 km away.

pp 22 - 24: "ON THE HOSPITABLE SOIL OF VIETNAM," by A. Chernykh, UL7PAE, Temirtau, Karagandinskaya Oblast'.

The idea of organizing an expedition to Vietnam was born almost three years ago. But serious work didn't begin until January 1988, after Viktor Grunskiy, RL7GK, scientific secrtary of the Association of Young Scientists Attached to the Central Committee of the Komsomol [party youth organization] of Kazakhstan, visited us at RL8PYL. The thing is that the Komsomol of Kazakhstan has a [pobratim - meaning unknown - from the context possibly a counterpart organization], the Union of Communist Youth Named After Ho Chi Minh in the province of Shongbe. There was now a real possibility of carrying out our expedition within the framework of businesslike cooperation between these two friendly organizations.

The international amateur radio organization INDEXA provided our expedition an FT-101-Z transceiver and a two-element TA33M antenna. Gennadiy Kolmakov, UA9MA, was of great help in delivering this equipment to us.[10] We received a three-element antenna for 144 MHz from V. Semenov, UA3DK. We ourselves prepared masts and antennas for 28 and 21 MHz, for the low-frequency bands, and also two transceivers -- the "Meridian" and "Ural-89M." S. Kikhko, UL7PEZ, and V. Trubachev, RL7PAS, from our area helped prepare RTTY equipment. The NTTM [nauchno-tekhnicheskoye tvorchestvo molodezhi] center "Spektr," the "Start" cooperative in Temirtau, and the Semipalatinsk NTTM Center, financed the expedition.

Soon an invitation was received, the necessary documents were drawn up and signed, tickets were bought, and everything was assembled and packed.

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[10]Gennadiy I. Kolmakov, UA9MA/ex-UA9MAF, his wife Ol'ga Kolmakova, and Sergey Kruglov, UA9MC/ex-UA9MAC, all from Omsk, visited the USA in October and November of 1989.

On 23 January 1989, A. Lebedev, UL7PCZ, Yu. Loparev, RL8PY, and the author of these lines set off. We spent two days in Alma-Ata and together with the secretary of the Central Committee of the Komsomol of Kazakhstan, S. Sokharev and V. Grunskiy arrived in Moscow, where we were warmly greeted and greatly helped in the transport of our things by A. Fedorov, RW3AH, V. Beloshapko, UV3DF, and A. Burenkov, UA3DHF.

Eighteen hours after our IL-86 flew out of Sheremet'yevo-2, after making 4 stops, we landed in Ho Chi Minh City. Moscow saw us off with a freezing day, and the hospitable land of Vietnam greeted us with 35° [= 95°F] heat. Our Vietnamese friends greeted us no less warmly.

Upon arrival in Tkhudaomot (40 minutes north-west from Ho Chi Minh), we installed ourselves in our hotel. In one room we set up the basic operating position with the FT-101-Z. In another, a second operating position with the "Meridian" and the "Ural."

We installed a tilted triangle [Delta loop?] for 7 MHz and the TA33M antenna on the roof.

After an official reception by the leaders of the province, we went on the air at 1900 local time. The 7 MHz band was so noisy that we had difficulty having just a few contacts with Japan. We went over to 14 MHz -- there there was excellent propagation to Europe. Some gave us 59+20dB.

A few minutes later many stations from North America, South America, Africa, and Oceania began calling us. This was so unexpected that we gathered around the transceiver and couldn't believe our ears. Distant propagation to all continents, which continued on this band almost the whole night.

The next two days, between official events, we installed the five-element 28 MHz YAGI, the four-element 21 MHz YAGI, the tilted 7 MHz dipole, and the 3.5 MHz "Inverted-V."

We had breakfast, dinner, and supper in the same hotel. We got used to Vietnamese food quickly. It was tasty, and of course there were always many pieces of fruit on the table.

We took excursions during the day and had friendly meetings, but we tried to leave at least one operator on the air.

A week passed by in this way. By then we already had learned the "whims" ["prichudy"] of local propagation. It would change sharply, so we couldn't prepare a hard operating schedule.

A few more words about propagation. Basically Japan and Oceania were audible on 160m. Europe, but only Western Europe, came through only two mornings. We had almost no QSOs with Soviet stations, although we heard them and even called them. Here we should note the very good operation of UA1OLL and UA1OT (Franz Josef Land), whom we worked without difficulty on all six bands.

The situation was about the same on 80m, on which, as was also true of 40m, there was a high noise level. On 20m, Europe often came through long path in the morning. On 15m, there was extremely poor propagation to Europe, but this wasn't so for Japan and the USA. On 10m, many QSOs were made with Soviet stations, but in the morning we heard North America well. Naturally, there were very many QSOs with Japan. We also gave a certain amount of attention to operating in nets: YB3CN, I8YCP, W7PHO -- FAMILY, INDEXA -- DX NET, RB5FF and so forth.

Later analysis of the 3W0A log suggested that many Soviet radio amateurs evidently considered it their duty to have a QSO with us almost every day, and some even called us after [we had had only] three or four other QSOs [since their last contact with us]. This of course isn't a violation of ethical behavior, but as a result tens of other radio amateurs may have found it impossible to contact us at all.

During the four final days, we operated with the callsign 3W4KZ. We looked for satellites, but apparently the 21/28 MHz repeater wasn't switched on. Problems also occurred with our electrical power. Sometimes it went off two or three times a day. Nonetheless, operating with the callsigns 3W1A, 3W0A, and 3W4KZ, we had over 37000 QSOs. The rate on SSB got up to three QSOs a minute, and on CW to two QSOs a minute.

We got a great deal of satisfaction out of operating RTTY with the callsign 3W1A. We used a "Radio-86PK" computer with a controller designed by DJ6HJ and a portable television set. Only one operator, UL7PCZ, operated RTTY.

On account of not having a narrowband filter in the transceiver, we couldn't have a great number of QSOs during pile-ups, since up to 20 stations would immediately call us on frequencies that overlapped [perekryvalis']. As a result, we made [only] about 1000 contacts with 50 countries of the world on 14, 21, and 28 MHz.

Twenty days flew by before we knew it. It was sad to leave the hospitable land of Vietnam, where we left many good friends behind. But we flew off in hopes of many return visits.

We donated all of our equipment, antennas, and masts to the Vietnamese radio amateurs. We hope to hear them on the air in the near future.

[End of RADIO portion]

[This annex contains rough, summary translations of selected items from the newspaper **SOVETSKIY PATRIOT** (SP), published by the military training organization DOSAAF. Most of the news concerning amateur radio appears in the numbered column "**NLD**" ("**N**a **l**yubitel'skikh **d**iapazonakh" - "On the Amateur Bands"), edited by Boris Grigor'yevich Stepanov, UW3AX. Beginning in January 1990, "SP" has appeared once rather than twice weekly.]

NLD-1420, 8 - 14 January 1990:

DIPLOMAS [CERTIFICATES]

To earn the "Ukraina" memorial board -- plaque -- contacts must be made with all oblasts of the Ukraine on any six of the nine shortwave and ulrashortwave bands: 1.8, 3.5, 7, 14, 21, 28, 144, 430, or 1215 MHz. In other words, if working shortwave only, it is necessary to work all oblasts on each band (162 QSO's in all). QSO's by any mode count if made since 1 January 1988. Apply to 325000, Kherson, ab./yashch. 73, diplomnoy komissii [Diploma Commission, P. O. Box 73, 325000 KHERSON]. The cost is 20 rubles.

A diploma is issued for contacting warrier-internationalists [i.e., Afghanistan veterans] and members of the all-Union club "Muzhestvo" ["Courage"]. [For background on this club, see article "Afghan Campfire" in RADIO #10/1989.] RW3QWW at club headquarters and R3AFG are each worth 50 points and UZ3QZH [a collective station mentioned in the RADIO article] is worth 30 points [of the 110 points required for the diploma]. Send verified log extracts to 397140, Voronezhskaya oblast', Borisoglebsk, ab./yashch. 70, radioklub "Muzhestvo" (diplomnoy komissii) [Diploma Commission, "Muzhestvo" Radio Club, P. O. Box 70, 397140 BORISOGLEBSK (Voronezhskaya Oblast')].

CLUB NEWS

To join the club of those liking to operate telegraph [klub lyubiteley rabotat' telegrafom] (R-CW-C) being set up in Chernigov, you must have confirmed telegraph contacts with 100 oblasts of the USSR. The club issues 10 diplomas for CW operation. The address of R-CW-C is 250000, Chernigov, pochtamt, ab./yashch. 23 [P. O. Box 23, Post Office, 250000 CHERNIGOV]. Membership in the club is free. From UB1RR.

RADIOAMATEUR SATELLITES

The number of the first orbit of RS-10 on 13/20/27 January [1990], and the time and longitude of the ascending node, will be: 12817 - 0125 - 050°, 12914 - 0126 - 063°, 13009 - 0127 - 075°. Period: 104.958 minutes. Displacement: 26.381°. From RA3AT.

Independent article, Sovetskiy Patriot, 15 - 21 January 1990:

DECREE [UKAZ] OF THE PRESIDIUM
OF THE SUPREME SOVIET OF THE USSR
on the awarding of orders and medals of the USSR
[to] sportsmen and trainers of DOSAAF USSR
[first of twenty recipients named in decree]

For high sport achievements in technical and military-application forms of sport:

ORDER OF HONOR [ORDEN POCHETA]

BYCHAK[11], Lyubov' Nikolayevna[12] - Master of Sport of the USSR International Class, Khar'kovskaya Oblast' [Ukrainian SSR].

NLD-1421, 15 - 21 January 1990:

COMPETITIONS [CONTESTS]

[Rules for UBA CW CONTEST, 27 - 28 January, and HA CW DX CONTEST, 20 - 21 January 1990.]

DISTANT STATIONS

[Frequencies for special station PA6GN, which will operate until 27 January 1990.]

NLD-1422, 22 - 28 January 1990:

COMPETITIONS

[Results of WAE CW DX CONTEST.] The winner in Europe was Y24UK and the winner outside of Europe was H27T[13].

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[11]Here is an example of the fact that not all Slavic women's names in the USSR end in -a (though most do).

[12]RADIO #11/1989 p 15 reported that World Champion Lyuba Bychak (which I misspelled Buchak on page 9 of the corresponding summary translation p 9) took first place in the Sport Radiodirection-finding Championship of the USSR (chempionat SSSR po sportivnoy radiopelengatsii), held at Siauliai, Lithuania, date(s) not given.

[13]On the assumption that H27T is in Cyprus, the Cypriots -- or at least the Greek Cypriots -- regard Cyprus as part of Europe.

CLUB NEWS

UR3RA will be active through 28 February [1990], on all shortwave bands, from UM1M, UM2Q, UM3N, UI4O, and UI5F[14], on CW, SSB, and possibly RTTY. QSL cards may be sent to 200017, Estoniya, Tallin, ab./yashch. 830 [P. O. Box 830, 200017 TALLIN, Estonia]. From UR3RA.

The dispatch of QSL cards for last year's 4J1FS operation has begun. Please -- don't send duplicate QSLs to UW3DH (especially not to UW3AX or UY5XE) until these cards have been sent out.

From 5 through 19 February the ZILAN DX CLUB expedition will operate from Chardzhou [administrative center of Chardzhouskaya Oblast', No. 046, non-RSFSR identifier H-Y, in the Turkmenskaya SSR] and from 20 February through 5 March from Tashauz [Tashauzskaya Oblast', 045, H-W] on all shortwave bands, CW and SSB. Callsigns starting with RH and UH containing various numbers, individual callsigns following a fraction bar, and UZ4PZP [will be on the air]. Address: RA4PF, 420107, Kazan', ab./yashch. 1, RA4PF [RA4PF, P. O. Box 1, 420107 KAZAN'].

[end of SOVETSKIY PATRIOT annex]

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[14]Except for stations in the RSFSR, which have A, V, W, or Z as their second character, the number in the callsign has no significance. The letter preceding the number indicates the Union Republic and the letter following the number the oblast' or other geographical area within the Union Republic. The letter M preceding the number identifies the amateur station as being in the Kirgizskaya SSR. Thus, M-M ("Oblast'" No. 036) identifies rayons directly subordinate to the Kirgizskaya SSR; M-N = 034 = Oshskaya Oblast'; M-Q = 033 = Issyk-Kul'skaya Oblast'. The letter I preceding the number = Uzbekskaya SSR; I-O = 050 = Namanganskaya Oblast'; I-F = 047 = Andizhanskaya Oblast'.

[ARTICLE ON "MIR" SPACE STATION]

"AMATEUR RADIO STATION ON THE 'MIR' ORBITING COMPLEX"

by Valeriy Kondratko, UV3DQE

[Rough, informal translation by Dexter Anderson, W4KM]

The space flight by the team [consisting of] Vladimir Titov and spacecraft engineer Musa Manarov[15] began 21 December 1987, when they replaced Yuriy Romanenko, Aleksandr Aleksandrov, and Anatoliy Levchenko. The team was to spend a whole year in orbit. Titov and Manarov were physically and psychologically prepared for a flight of this duration.

As a rule, a lengthy stay in a limited space has a negative psychological effect on human beings. Only a conscious execution of a task in the name of a worthy goal protects against this effect. Experience shows that during the first two weeks the team gets accustomed to the space station, the equipment, and with coordination with mission control. A great amount of stellar observations, photographing of the Earth's surface, medical checkups and experiments, and maintenance of the spacecraft systems occupies all the crew's attention. Rational alternation between work time and rest time maintains a great capacity for work and a good mood. However a long flight is a long flight. If time is perceived as the sum of days it drags by slowly. Enthusiasm for the work condenses time and the perception of time. So the crew adopted important milestones and points of reference for counting off the flight time. These points of reference consisted of: Launch, docking with freight vehicles, meetings with visiting expeditions, and excursions into open space.

In January [1988], the team received the freight vessel "Progress-34" which brought supplies, fuel, new instruments, and mail. In February, the first excursion into open space: An experimental element with a new cover on the solar battery was installed.

In a conversation with ground control on the eve of the launch of the freight vessel "Progress-35" in March [1988], Musa Manarov asked that "Radio" magazine be sent to him.

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[15]Musa Khiramanovich Manarov, who visited Washington DC in May 1989, was made a Hero of the Soviet Union for his year-long space flight.

The Psychological Support Group, among whose duties it was to deal with requests by crew nembers, asked the editorial offices of "Radio" to provide several issues that Musa had not read. At the editorial offices, they were delighted by his interest and sent a letter along with the magazines, asking, among other questions, whether he wouldn't like to do some operating on the radio amateur airwaves himself. Musa replied that there was no [amateur] equipment on board, that organizational matters hadn't been resolved [this reference may be to the complex procedure of getting an amateur license in the USSR], and that in general no one among the crew members had operated on the air, but that, if mission control would help resolve these matters, he'd be happy to operate on the air during his free time.

From that moment on, the employees of the Flight Control Center, together with the editorial offices of "Radio" magazine, took on these problems.

Meanwhile, in May [1988], the crew received the regularly-scheduled freight vessel "Progress-36." And on 9 June the long awaited international Soviet-Bulgarian expedition in the transport vessel "SoyuzTM-5," consisting of Commander Anatoliy Solov'yev and spacecraft engineer Viktor Savin[ych?], a citizen of the Bulgarian People's Republic. The expedition carried out a large number of scientific experiments under an international program and completed its work in a week. On the one hand such an expedition is a great joy for the basic crew, on the other hand the pressure on the basic crew increases many fold during these days. The established routine is broken, work intensifies, the newcomers to space have to be helped, and therefore fatigue builds up.

During this time, "Radio" employees were looking for an appropriate transceiver for the space station. Soviet radio amateurs learned of this, and Valeriy Agabekov, UA6HZ, turned over his FT-290YAESU. The transceiver was delivered to the spacecraft by the regularly-scheduled freight vehicle "Progress-37."

But the delivery of the transceiver didn't mean that operation could begin. That was because the constructors decided, for the sake of maintaining dependable official communications, not to connect the transceiver to the existing antennas. In considering various alternatives, Musa came to the conclusion that it was necessary to put a separate antenna on the outer surface of the "Mir" station's fuselage and to connect it to the existing hermetic connector [? - podklyuchit' yeye k imeyushchemusya germoraz"yemu]. To do this, an antenna had to be made and installed during the next excursion into open space. Musa took a piece of 2mm copper wire and, bent it in two, and twisted it [??? - svernuv yeye vdvoye, skrutil]. Then he picked up a connector and soldered it to the dowel [Potom podobral raz"yem i podpayal yego k shtyryu].

An excursion into open space to replace the [a?] detector unit [dlya zameny bloka detektorov] in the x-ray telescope took place 30 June [1988]. On the same occasion, Musa planed to install his homemade antenna, which he put not far from the exit hatch. However, the situation developed in such a way that there was no question of installing the antenna. The work outside the [space] station lasted 5 hours 10 minutes. Titov and Manarov completed their work at the resource limits of their spacesuits and were very tired. The installation of the antenna was put off until the next excursion. Making use of the forced postponement, Musa asked mission control about [supplying] a commercially-built antenna.

On 30 August [1988], the regularly-scheduled "SoyuzTM-6" transport docked up with the [space] station, carrying an international Soviet-Afghan team consisting of Commander Vladimir Lyakhov, cosmonaut-reseracher Vareriy Polyakov, and Cosmonaut-Researcher Abdul Akhad Momand, a citizen of the Democratic Republic of Afghanistan. After completing their program, Lyakhov and Momand returned to Earth, and Valeriy Polyakov, a physician by speciality, joined the basic expedition to carry out advanced medical research.

By the time the regular freight vessel "Progress-38" was launched, an antenna for the amateur radio station was made. By then, licenses had been issued to the cosmonauts:

-- U1MIR to Vladimir Titov;
-- U2MIR to Musa Manarov;
-- U3MIR to Valeriy Polyakov.

Soon after the return [to Earth] of the visiting expedition in September [1988], the freight vessel "Progress-38" delivered the long-awaited antenna.

Preparing for a regularly-scheduled excursion [into open space], Manarov also prepared the antenna. At the root [base?] [U kornya] of the antenna, he twisted on [prikrutil] a handle [consisting] of insulation tape so it would be easy to hold in his hand in the spacesuit when exiting [the spacecraft]. Snipping off from his loading suit [??? - Otporov ot nagruzochnogo kostyuma] a little red flag, Musa secured it to the end of the antenna.

A regularly-scheduled excursion into open space took place 20 October [1988] to repair the Dutch telescope. This time the work want very successfully and the crew still had time for installing the radio amateur antenna. From the transfer compartment, Vladimir Titov passed the antenna to Musa, who, forcing his way along the fuselage of the [space] station to the conical part of the working compartment, freed the hermetic convertor from screen-vacuum isolation [??? - osvobodil iz-pod ekranno-valkuumnoy izolyatsii germoraz'yem], affixed the antenna to it, and, for good measure, fastened a halyard with a hook to the handle of the antenna on one side and with another hook to the handrail located on the outer surface of the [space] station [??? - prikrepil karabinchikom fala za ruchku antenny, s odnoy storony, i drugim karabinchikom za poruchen', raspolozhennyy na vneshney poverkhnosti stantsii]. Now the possibility had opened up of operating on the amateur radio airwaves.

For some time after they first turned the set on, Manarov, Titov, and Polyakov just listened. First they heard noise. The first distinct speech came through when they were flying over the United States of America. Since no one of the crew had previously operated on the air, many difficulties arose. The first problem was language. The members of the crew could read English, but no one had an oral command of the language. To enter into radio communication, it's necessary to be able to read callsigns, and they didn't have this skill either.

Understanding these difficulties, mission control invited some radio amateurs over in order to help the members of the crew to the maximum extent possible to overcome these "childhood deceases." Instructions, teaching sessions [??? - metodiki], and official discussions were set up, to which radio amateurs came for consultations.

The first contact took place 8 November [1988] with UK3KP, the radio station of the newspaper "Komsomol'skaya Pravda." Leonid Labutin, UA3CR, contacted Manarov. Audibility wasn't very good, but this the initial experience. On 12 November, an AMSAT symposium on satellite amateur radio communication opened at Atlanta, USA. And on that very day Manarov contacted radio station W4BIW, the operator of which was the same Leonid Labutin, UA3CR, who had been invited to that symposium. From then on, Musa operated on his own.

Flying over the United States, he heard a conversation between two high-quality stations. Wanting to avail himself of the opportunity of entering the conversation, he pronounced his callsign "U2MIR." They came back and easked him who he was. He repeated. "It's probably someone messing around" ["Navernoye, kto-to baluyetsya"], said one to the other, and they continued their conversation, paying no attention to Manarov's attempts to contact them.

Flying over India, Musa clearly heard the callsign VU2LK - Bob. Bob was surprised, and asked him what kind of callsign this was. Musa explained, one from the Soviet Union. "From an airplane, right?" guessed the operator. "No, from space." "I can't believe it!" the operator said. It was his first contact with a cosmonaut.

Musa put the transceiver in his cabin. Now he went on the air whenever he had free time. He gradually acquired confidence, understood callsigns more easily, got practice in the English language. The other members of the crew also tried their luck, but couldn't completely overcome the psychological barrier between them and on-the-air operation. Valeriy Polyakov gladly helped Musa with translations, but refrained from operating himself.

Soon the amateur radio world knew that a radio station was operating in orbit. Now others were calling Musa. Repeat stations appeared. Back on 14 November [1988], flying over Argentina, he contacted Carmen, LU1UK. When she understood whom she was contacting, she exclained: "Wait!" ["Postoyte!"] -- as though the space station could delay its flight -- and disappeared for a minute. And soon Simon, LU6YH, was calling U2MIR -- Carmen had called him. It turned out that Simon had invited the Deputy Minister of the Forestry Industry of the RSFSR, who was in Argentina on official business, to be present for the contact.

With the appearance of the amateur radio station aboard the spacecraft, the communications horizons had widened. Previously cosmonauts had one possibility for communicating -- the Flight Control Center. And even though many people came to meet them [came to the Flight Control Center to communicate with them] -- specialists, relatives, invitees -- now random meetings and new acquaintances had become possible. Under conditions of a lengthy space flight, such a possibility was an extremely important factor in the psychological relieving [relaxation? - razgruzka] of the crew. Now, while overflying any continent, one could find someone to talk to.

The large number of radio stations in the United States of America and in Europe made contacts difficult, since their operations came through as solid noise, and only powerful stations broke through in these areas. Beyond the Urals silence set in; in this area there are practically no radio stations. It was very pleasant to work stations from the Republic of South Africa and Australia; they operated in a very disciplined fashion, although even there humorous situations arose. For example, the operator of ZS2ELL couldn't manage to get a confirmation of communication and started to call, inserting the Russian words "na zdorov'ya" ["to your health"] and "perestroyka." Musa, of course, was struck [? - srazhen] [by this] and a contact took place.

On 28 November [1988], the joint Soviet-French expedition, consisting of Commander Aleksandr Volkov, spacecraft engineer Sergey Krikalev, and Cosmonaut-Researcher Jean-Loup Chretien, a citizen of the French Republic, arrived on the "Mir."

Volkov and Krikalev came to relieve the basic crew. For a whole month six cosmonauts worked at the station, carrying out a great amount of scientific reserach and experiments, including an excursion into open space by the French cosmonaut.

On 21 December, cosmonauts Vladimir Titov, Musa Manarov, and Jean-Loup Chretien returned to Earth. The unprecedented flight was over. Much more time will be needed to assess the meaning of the results of over a year of scientific research. But already the crew's contribution in setting up the "Space - Earth" amateur radio bridge can be assessed. The crew was able to make over a thousand contacts with radio amateurs in various countries. The radio station remained on the spacecraft, and whether the bridge will be continued will depend on the wishes of [future] cosmonauts.

ORBITING STATION "MIR"

1. Basic module
2. "Soyuz T" vessel
3. Transfer compartment
4. Manipulator socket
5. Side docking units
6. Approach-system antenna
7. Working compartment
8. Working-compartment hatch
9. Central control post
10. Handrail
11. Interior panels
12. Solar cells
13. "Activity speed meter" trainer
    [??? - Trenazher "Veloegrometr"]
14. Working desk
15. Individual cabin
16. Toilet
17. Wash stand
18. Satellite repeater antenna
19. Axial docking unit
20. "Running track" trainer
21. Intermediate chamber
22. Propeller with cover
23. Target
24. Unit compartment
    [??? - Agregatnyy otsek]
25. Hatch cover
26. Illuminator
27. Illuminator blind
    [? - Blenda illyuminatora]
28. Place for mounting the MOB
    [expansion of MOB unknown]

[end of Annex 2]

Rough Translation from Pravda, 2 March 1990, p 8:

"IS INITIATIVE PUNISHABLE?"
(from mail received by the Information Department)
from L[eonid Mikhaylovich] Labutin [UA3CR/AB4LZ]
Meritorious Communicator of the RSFSR

Dear editors! All of my life has been devoted to radicommunication. Fifty-two years separate the detector receiver I assembled as a ten-year-old boy in 1939, from the radioamateur satellite equipment my colleagues and I build today.

I've taken first place in the shortwave radiocommunication championships of the USSR six times. I'm a Master of Sport and a meritorious communicator of the RSFSR. Books and articles have been written about me. I'm proud of the orders [decorations] awarded to me for providing radio services during arctic expeditions. But my main awards are the hundreds of thousands of radio contacts with people from various countries that I've made during 40 years on the air.

Why am I addressing myself to Pravda? Because in April 1989 the Federation of Radio Sport of the USSR took away my right to operate on the air "for actions reflecting badly [? - porochashchiye] on the Soviet shortwaver."

Just what happened? As a result of the tragic earthquake in Armenia [7 December 1988], communications there were paralysed. The staff of the Central Committee of the Komsomol, organized for extending assistance, called me in to work as a specialist and as a radio amateur. During these same days the Federation of Radio Sport of the USSR and the Central Committee of DOSAAF received many offers to assist with equipment and specialists. Two amateur radio organizations in the USA, not having received answers from officials of the Federation, addressed themselves directly to radio amateurs, including myelf. After coordinating the answer with the staff of the Komsomol Central Committee, we advised the Americans that we were prepared to receive assistance. The composition of the first batch of equipment was determined by the Americans. The composition of the second batch was determined mutually; we had in mind that the Central Committee of the Armenian Komsomol had begun to design the "Search" system [apparently a welfare-whereabouts system] based on modern computer equipment. All matters concerning the transfer of equipment to the "Search" service were decided by official workers of the Komsomol Central Committee staff and were coordinated with the Council of Ministers of the Armenian SSR.

Note that the work did not take place within the framework of DOSAAF, although radiosport, as a technical form of sport, is subordinated to the Defense Society [DOSAAF]. Evidently, this was what caused jealousy toward me on the part of the officials of the DOSAAF Central Committee and of the Federation [of Radio Sport]. And the Chairman of the Short Wave Committee of the Federation, K. Khachaturov, in radiograms sent over the air to the USA, accused

me of concealing equipment sent to the USSR. Over the air the words "grabezh" [robbery] and "maroderstvo" [marauding] rang out. These same accusations were made against me on the pages of "Radio" [magazine] and at a session of the Presidium of the Federation of Radio Sport of the USSR. The responsible official of the DOSAAF Central Committee, Colonel V. Pavlov, called my action "worse then marauding" and suggested I be "severely punished and removed from all amateur radio affairs."

How paradoxical! No proof of my "guilt" exists. No one has taken me to court. But a social organization took rapid action [??? - raspravilas'] [against] a person who showed "excessive" independence.

A year and a half ago I passed a fairly complicated exam (200 questions) and was the first Soviet shortwaver to receive the top class of American callsign, giving me the right to operate on the air from the territory of the USA for life. Only a governmental establishment of the USA has the right to take away my American callsign and [then] only in the event that I violate on-the-air operating rules. In America there is no DOSAAF instruction containing an article on taking away the right to operate on the air "for actions reflecting badly on the worthiness of Soviet radio amateurs." Treat [??? Traktuy] [that] as you wish.

Three times I addressed protests to the Chairman of the Central Committee of DOSAAF, General-Lieutenant N. Kotlovtsev, and asked him to intervene in the lawlessness that had been perpetrated. Each time in reply he finished by saying that the decision was made by a social organization and not by the Central Committee. But my main accusers were DOSAAF workers, no one else.

In reply to S. Matveyev, a radio amateur from Arkhangel'sk who expressed doubt about my guilt, the Chief of Administration of the Central Committee of the Defense Society, Vice Admiral A. Vinnik, stated "the FRS of the USSR examined this matter and punished the guilty party. At the present time the equipment is in Armenia." As though the equipment got to Armenia thanks only to the intervention of DOSAAF. This is absolutely absurd!

The equipment has in fact been in Armenia for a long time, but neither the Federation nor DOSAAF had anything to do [with getting it there]. It operates in the system of the Armenian Republic computer information center "Poisk" ["Search"] and serves the noble purpose of reestablishing contact between people who have lost [contact with] each other. The central newspapers recently wrote about this system.

The workers of the DOSAAF Central Committee and of the Federation of Radio Sport, which is subservient to DOSAAF, have blamed their inactivity on a single person.

[end of Annex 3]